29671
S/169/61/000/005/034/049
A005/A130

3,2410
3,1800 (1041, 1046)

AUTHORS: Kus'min, A.I., Skripin, G.V.

TITLE: On the decrease effect of cosmic ray intensity during magnetic storms

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 5, 1961, 13, abstract 5 G 104. (Tr. Yakutskogo fil. AN SSSR. Ser. fiz., 1960, no. 3, 121-139)

TEXT: The authors investigated the upper limit and shape of the energy spectrum of primary particles of cosmic rays subjected to the action of the mechanism responsible for magnetic storms. For the analysis they used data obtained from continuous recording of intensity at Yakutsk by a neutron monitor, an ionization chamber and counter telescopes placed at depths of 0.7, 20 and 60 m of water equivalent. The data were corrected for the barometric and temperature effects. The presence of effects of intensity decrease at depths of up to 60 m w.e. shows that the mechanism which modifies cosmic ray intensity during magnetic storms affects particles with energies up to 400 Bev. This being the case, the energy

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On the decrease effect of cosmic ray intensity...

spectrum of primary variations has the form:

$$\frac{\delta_D}{D}(\mathcal{E}) = \begin{cases} -0.11 \pm 0.03, & \text{when } \mathcal{E} \leqslant (7 \pm 2) \text{ Bev} \\ (-0.22 \pm 0.03)\cdot\mathcal{E}^{-0.7 \pm 0.2}, & \text{when } \mathcal{E} \geqslant (7 \pm 2) \text{ Bev} . \end{cases}$$

This form of the spectrum contradicts the concept of scattering of charged particles by the magnetic field of the stream that has an intensity of about 10^{-4} gauss in the earth's orbit. The authors assume that two mechanisms act in the decrease of cosmic ray intensity during magnetic storms: one mechanism is connected with the magnetic field of the stream, and the other with the electric field. What is more, the magnetic field plays an inconsiderable role in the scattering of high energy particles, and its action occurs in the main at the beginning and end of magnetic storms. The authors point out the necessity of strictly taking into account meteorological effects when estimating the effects in cosmic rays during magnetic storms.

N. Kaminer

[Abstractor's note: Complete translation.]

Card 2/2

KUZ'MIN, A.I., KRIMSKIY, G.F., SHAFER, G.V., SHAFER, YU.G., V RNOV, S.N.,

"Cosmic Ray Outbursts on November 12-15, 1960,"

report presented at the Intl. Conference on Cosmic Rays and Earth Storms, Kyoto, Japan, 4-15 Sept 1961.

S/058/62/000/006/018/136
A061/A101

AUTHORS: Kuz'min, A. I., Yefimov, N. N., Krasil'nikov, D. D., Skripin, G. V., Sokolov, V. D., Shafer, G. V., Shafer, Yu. G.

TITLE: A study of the variations with time of different cosmic ray components by one-point observations

PERIODICAL: Referativnyy zhurnal, Fizika, no. 6, 1962, 53, abstract 6B371 (In collection: "Kosmicheskiye luchi", no. 3, Moscow, AN SSSR, 1961, 64 - 79, English summary)

TEXT: A recording apparatus of the Yakutsk cosmic radiation post is described, and the principal results of a study on variations of intensity are presented. The following instruments are laid out on the surface of the Earth: a neutron monitor, two shielded ionization chambers, and counter telescopes recording vertical and oblique cosmic ray components. In addition, counter telescopes placed at depths of 7.20 and 60 m water equivalent record the muonic component in the energy range of $2 \cdot 10^9 \div 10^{11}$ ev, while the continuous frequency recording on latitudinal atmospheric showers yields information on $5 \cdot 10^{13} \div 10^{16}$-

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A study of the...

S/058/62/000/006/018/136
A061/A101

ev particles. The values of the barometric coefficient of different components are indicated, as well as the principal results of an investigation of 27-day and solar day variations of intensity. Phenomena observed during magnetic storms are briefly described. The interrelation factors between variations of intensity of primary and secondary cosmic ray components up to energies of ~700 Bev are determined. These factors are utilized for the analysis of some types of variations of intensity.

N. Kaminer

[Abstracter's note: Complete translation]

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3,2410 (2205, 2705, 2805)
3,9120

37290
S/169/62/000/004/075/103
D218/D302

AUTHORS: Kuz'min, A.I., Danilov, A.A., Krymskiy, G.F., and Skripin, G.V.

TITLE: Energy characteristics of cosmic-ray variations during magnetic disturbances

PERIODICAL: Referativnyy zhurnal. Geofizika, no. 4, 1962, 14, abstract 4G74 (V. sb. Kosmicheskiye luchi, no. 4, M., AN SSSR, 1961, 16-24)

TEXT: The data obtained with a number of surface and underground instruments at Yakutsk are used to analyze the energy characteristics of cosmic-ray intensity variations during magnetic storms. It is shown that the intensity recovery period after the Forbush-effect minimum decreases with increasing depth of the recording device. For some Forbush-type reductions there is a noticeable North-South anisotropy in this effect. The method of coupling coefficients is used to determine the energy spectrum of the primary radiation during Forbush effects. Best agreement between experimental data and theoretical predictions is obtained with the following primary differen-

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Energy characteristics of ...

tial spectrum

$$\frac{\delta D(\varepsilon)}{D(\varepsilon)} = - a \begin{cases} \varepsilon^{0.7} & \text{at } \varepsilon > \varepsilon_1 \\ 0 & \text{at } \varepsilon < \varepsilon_1 \end{cases} .$$

Further analysis shows that the effective width of the corpuscular stream should depend on the energy of the scattered particles. It is suggested that the regular field of the stream carries with it magnetic irregularities which give rise to scattering and diffusion of moderate-energy particles. The parameters of the streams, and the magnetic irregularities carried by them, are estimated. [Abstractor's note: Complete translation].

Card 2/2

DORMAN, L.I.; KUZ'MIN, A.I.; SKRIPIN, G.V.

Sounding electromagnetic conditions in the interplanetary space and in the vicinity of the earth by high-energy cosmic rays. Geomag. i aer. 1 no.3:333-345 My-Je '61. (MIRA 14:9)

1. Magnitnaya laboratoriya AN SSSR i Laboratoriya fizicheskikh problem Yakutskogo filiala Sibirskogo otdeleniya AN SSSR.
(Cosmic rays)

KUZ'MIN, A.I.; SHAFER, G.V.; KRYMSKIY, G.F.; SHAFER, Yu.G.

Cosmic ray flares during Nov. 12-15, 1960. Geomag. i aer. 1 no.4:510-522 Jl-Ag '61. (MIRA 14:12)

1. Sibirskoye otdeleniye AN SSSR, Yakutskiy filial.
(Cosmic rays)

21493
S/020/61/137/004/017/031
B104/B206

9,9130 (incl. 2305, 2705)

AUTHORS: Kuz'min, A. I., Krymskiy, G. F., Shafer, G. V., and Schafer, Yu. G.

TITLE: Cosmic radiation flares from November 12 to 15, 1960

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 4, 1961, 844-847

TEXT: During the period of November 12 to 17, 1960, intense cosmic radiation, connected with events on the sun, were observed in Yakutsk (geomagnetic latitude 51°) by continuous observations. The recordings are shown in the two figures. The sudden intensity increase of the neutron component started on November 12, at 13 hr 45 min (1345 UT) universal time and coincided with the start of a very strong magnetic storm (1348 UT). At 1630 UT the intensity reached a maximum, which was 65 % higher than the normal value. At 1815 UT a second rise of the intensity started and reached a maximum value at 2000 UT, which was 100 % higher than the normal value. Both times radio waves were totally absorbed in the ionosphere above Yakutsk. With the start of the second rise of the neutron component, a drop of the Forbush type was indicated by all recording devices for the

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Cosmic radiation flares from...

hard component of cosmic radiation. The energy spectrum of the drop is satisfactorily described by Eqs.

$$\frac{\delta D(\varepsilon)}{D(\varepsilon)} = -f\begin{cases} 1, & \text{если } \varepsilon < \varepsilon_1/4; \\ \frac{2}{\pi}\arcsin(\varepsilon_1/2\varepsilon - 1), & \text{если } \varepsilon_1/4 < \varepsilon < \varepsilon_1/2; \\ 0, & \text{если } \varepsilon > \varepsilon_1/2. \end{cases} \quad (2)$$

ε_1 = 130 - 170 Bev. A second and third flare of the hard component of cosmic radiation was also observed, the third being described as Delling effect. The coincidence of the start of the magnetic storm and the first flare convinces the authors that the initial particle flare was a corpuscular flow which then triggered off the magnetic storm. The velocity of the corpuscular flow is given as $3 \cdot 10^8$ cm/sec. If it is assumed that the reduction of the Forbush type is caused by the regular magnetic field, it can be concluded from the delay of this effect compared with the start of the magnetic storm that the magnetic field was strongly disturbed in the front part of the flow. It is possible that the particle flow reached there an energy comparable with the energy density of the magnetic field. The relatively small second reduction of the intensity of the hard

S/020/61/137/004/017/031
B104/B206

Cosmic radiation flares from...

component of cosmic radiation and the absence of a neutron-component reduction points towards the existence of accelerated particles in the particle flow. Amplitudes and time of the maximum of the daily disturbances agree with the velocity of the particle flow and the direction of the magnetic field in the flow (opposite to that of the earth). The authors come to the conclusion that the ejection of the particle flow was caused by solar cosmic rays, which partly produced the flares on the earth and was partly captured by the particle flow. Particles of up to 7 Bev were captured thereby. For a free incidence of the particles of the second flare on the earth, it was necessary that the direction of the magnetic field of the first flow coincided with the axis of this flow. There are 2 figures and 3 Soviet-bloc references.

ASSOCIATION: Laboratoriya fizicheskikh problem Yakutskogo filiala Sibirskogo otdeleniya Akademii nauk SSSR (Laboratory for Problems of Physics of the Yakutsk Branch of the Siberian Department, AS USSR)

PRESENTED: December 16, 1960, by M. A. Lavrent'yev, Academician

42262

S/845/62/000/004/005/013
E032/E314

3.2410 (2805)

AUTHOR: Kuz'min, A.I.

TITLE: The role of the upper layers of the atmosphere in small effects in the hard component of cosmic rays during chromospheric solar flares

SOURCE: Akademiya nauk SSSR. Yakutskiy filial. Trudy. Seriya fizicheskaya. no.4. 1962. Variatsii intensivnosti kosmicheskikh luchey, 61-65

TEXT: Data obtained as a result of continuous recording of the hard component of cosmic rays by surface and underground counting arrays during 1957-1959 are discussed. The energy characteristics of cosmic-ray variations were investigated at Yakutskaya laboratoriya (Yakutsk laboratory) with an array of triple-coincidence counter-telescopes at sea-level and at depths of 7, 20 and 60 m of water equivalent. A re-examination of the experimental results reported earlier (A.I.Kuz'min, A.A.Danilov, Tr. YaFAN SSSR, ser. fizich., no.3, 1960, 58), in the light of the formulae given by L.I.Dorman et al (ZhETF, 26, 1954, 537) shows that if there is a reduction in the temperature of the ozone layer during small chromospheric flares, opposite effects should be

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observed in the intensity of the hard component at sea-level and at 60 m of water equivalent. Short-wave fade-out was used in the experimental part as an indication of a chromospheric flare on the Sun (Dolbear et al, J. Ter. Phys., 1, 1951, 187). Analysis of the data, corrected for the barometric effect and the average diurnal variation, showed that there were no appreciable changes in the intensity of μ-mesons at the three depths below sea-level during and after the fade-out. It is estimated from these data that the temperature oscillations in the 0 to 25 mb layer are of the order of 5°. It is shown that this is, in fact, the maximum possible change for the period 1957-1959. It is consistent with the data reported by Kaminer (YaFAN SSSR, ser. fizich., no.3, 1960, 92) for 1955-1956. Next, radio fade-out data were analyzed by the method of superposition of epochs for the cases when the Yakutsk Station was in the "zone of incidence" and outside it. "Zone-of-incidence" calculations due to Kaminer (YaFAN SSSR, ser. fizich., no.3, 1960, 148) were used in this analysis. Although there were 37 cases of radio fade-out when Yakutsk lay in a zone of incidence and 38 cases when it was outside this zone, it was found that there were no appreciable changes in the intensity of the neutron and hard component in any of these cases. There are 3 figures.

42263

S/845/62/000/004/006/015
E032/E314

3.2410 (2805)

AUTHORS: Kuz'min, A.I. and Skripin, G.V.

TITLE: Underground variations in the intensity of cosmic rays during 1957-1959

SOURCE: Akademiya nauk SSSR. Yakutskiy filial. Trudy. Seriya fizicheskaya. no. 4. 1962. Variatsii intensivnosti kosmicheskikh luchey, 66 - 82

TEXT: The intensity of the μ-meson component was measured with a system of counter-telescopes at different depths below sea-level (7, 20 and 60 m of water equivalent). Variations in the intensity of the μ-meson component at sea-level could be investigated with this apparatus for an energy range of 2×10^8 to 2×10^{10} eV, which corresponded roughly to average primary-particle energies between 40 and 200-400 BeV. The vertical intensity in a solid angle of π and the intensity from the southern and northern directions at 30° to the zenith were recorded at each level with triple-coincidence telescopes. The accuracy was sufficient for the detection of fine effects provided the recording was extended over a period of some months or more. It was found that meteorological

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effects in the intensity of the hard component at sea-level and the above three depths were in agreement with the μ-meson scheme for the generation of the hard component in the atmosphere, suggested by L.I. Dorman (Variatsii kosmicheskikh luchey (Variation in cosmic rays), Gostekhizdat, Moscow, 1957). The best agreement between experiment and theory is found to occur for the following values of the exponent γ in the effective integral μ-meson spectrum:

sea level	-	$\gamma = 0.3$
7 m w.e.	-	$\gamma = 0.5$
20 m w.e.	-	$\gamma = 0.8$
60 m w.e.	-	$\gamma = 1.$

The meteorological effects at different depths below sea-level are in good agreement with Dorman's theory (mentioned above). This is confirmed by the fact that observed seasonal variations in the μ-meson intensity at different depths and the expected changes due to temperature effectswere identical to within experimental and computational error. Analysis of solar-diurnal variations at a fixed point again confirmed Dorman's theory of the modulation of

Underground variations ....

the primary cosmic-ray intensity by the electric fields of solar corpuscular streams. The lower energy limit for particles modulated by these streams is 12 BeV and the effective source of these variations lies to the left of the Earth-Sun line at an angle of $66 \pm 11^{\circ}$. The ratio of the amplitudes of 27-day variations and the reduction in intensity during magnetic storms are the same within a wide primary-particle energy range (2×10^{9} - 4×10^{11} eV) so that it is suggested that they are due to a common mechanism. The energy spectrum of primary variations is of the form:

$$\frac{\delta D(\varepsilon)}{D(\varepsilon)} = -\begin{cases} b, & \varepsilon < \varepsilon_1 \\ a\varepsilon^{\alpha}, & \varepsilon > \varepsilon_1 \end{cases}$$

where $\varepsilon_1 = 7 \pm 2$ BeV, $\alpha = -0.7 \pm 0.3$, $a = 0.22$ and $b = 0.11$ for the magnetic-storm effects and $a = 0.06$, $b = 0.03$ in the case of the 27-day variations. This spectrum is consistent with that expected on the Dorman theory due to the scattering of particles by the frozen-in magnetic field of a stream with an

Underground variations ....

intensity of 10^{-4} gauss at the Earth's orbit but appreciably disturbed by the interaction between the stream and the interplanetary medium. The considerable change in the energy spectrum of particles with $\varepsilon \geq 30$ BeV in the primary stream during magnetic storms suggests the presence of irregularities in the regular magnetic field of the stream and the importance of the influence of electric fields. There are 5 figures and 5 tables.

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12265
S/845/62/000/004/008/013
E032/E314

3.2410 (2805)

AUTHORS: Kuz'min, A.I. and Skripin, G.V.

TITLE: On some basic properties of disturbed diurnal variations in the intensity of cosmic rays

SOURCE: Akademiya nauk SSSR. Yakutskiy filial. Trudy. Seriya fizicheskaya. no. 4. 1962. Variatsii intensivnosti kosmicheskikh luchey, 91 - 102

TEXT: J. Sekido and S.Joshido (Rep. Ionos Res. Japan, 4, 37, 1950), and the present authors (Tr.YaFAN SSSR, ser. fizich., no. 2, 107, 1958) have found that there is an increase in the amplitude of the solar-diurnal variation and a shift of the maximum towards earlier hours during and after magnetic storms. According to the theory of Dorman (Variatsii kosmicheskikh luchey (Variation in cosmic rays), Gostekhizdat, Moscow, 1957), this is due to the fact that during such storms the Earth enters a corpuscular stream carrying a large frozen-in magnetic field. The source of the solar-diurnal variation is then displaced towards the Earth-Sun line and the amplitude of the variations increases with the energy of the recorded particles. This theory has not so far been satisfactorily verified. The aim of this work was to use the data obtained at

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S/845/62/000/004/008/013
E032/E314

On some basic properties ....

Yakutsk to determine the main properties of disturbed solar-diurnal variations and to compare Dorman's theory with experiment. The analysis is based on 1957-1959 observations with the apparatus described in an earlier paper (the present authors and A.V.Yarygin, Tr. YaFAN SSSR, ser. fizich., no. 2, 34, 1958). The apparatus consists of counter arrays and telescopes at the Earth surface and at 7, 20 and 60 m of water equivalent. All the data were corrected for meteorological effects. Magnetic data were taken from the publications of IZMIRAN. The analysis covers only those cases when the reduction in the measured μ-meson intensity at the Earth surface was not less than 1%. These data show that magnetic disturbances are associated with considerable changes in the solar-diurnal variations of cosmic rays. The degree of disturbance in the amplitude and in the position of the maximum diurnal variations is greater at higher energies of the recorded particles. The maximum change in the diurnal variations during magnetic storms at all the four levels mentioned above was recorded by the telescope pointing in the direction parallel to the plane of the ecliptic and at 30° south of the zenith at a geographic latitude of 60°.

It was found that the experimental data on the disturbed diurnal

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variations during magnetic storms were consistent with a spectrum of the form

$$\frac{\delta D(\varepsilon)}{D(\varepsilon)} = \begin{cases} 0, & \varepsilon < \varepsilon_o \\ a\varepsilon^{-\alpha} & \varepsilon \geq \varepsilon_o \end{cases} \qquad (1)$$

where $\alpha = -0.5$ and $\varepsilon_o = 10 - 15$ BeV . Moreover, the experimental data are also in agreement (to within experimental error) with the variation spectrum accepted in Dorman's theory

$$\frac{\delta D(\varepsilon)}{D(\varepsilon)} = \pm \frac{f}{\varepsilon} \begin{cases} 1, & \varepsilon > \frac{\varepsilon_1}{2}, \\ 1 - \frac{2}{\pi} \sin^{-1}\left(\frac{\varepsilon_1}{2\varepsilon} - 1\right) & \frac{\varepsilon_1}{4} < \varepsilon < \frac{\varepsilon_1}{2} \\ 0, & \varepsilon < \frac{\varepsilon_1}{4} \end{cases} \qquad (2)$$

where $f = 0.30$ and $\varepsilon_1 = 80 - 100$ BeV. The source of these

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On some basic properties S/845/62/000/004/008/013
E032/E314

variations is found to lie at 35 ± 5° to the left of the Earth-Sun line. The source of diurnal variations during magnetic disturbances is associated with a mechanism whose position in space varies continuously. A large number of considerable disturbances in the solar-diurnal variation was noted during 1957-1959, during before and after magnetic storms. The general conclusion is that the main characteristics of disturbed diurnal variations are in good agreement with Dorman's theory, which explains them as the effect of the electric and magnetic fields of solar corpuscular streams reaching the Earth. There are 3 figures and 6 tables.

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42766
S/845/62/000/004/009/013
E032/E314

3.2410 (2805)

AUTHORS: Kuz'min, A.I. and Skripin, G.V.

TITLE: On the coefficient of absorption of cosmic rays which are responsible for solar-diurnal variation

SOURCE: Akademiya nauk SSSR. Yakutskiy filial. Trudy. Seriya fizicheskaya. no. 4. 1962. Variatsii intensivnosti kosmicheskikh luchey, 103 - 107

TEXT: Results of a comparison of diurnal variations in the μ-meson component of cosmic rays at the Earth's surface with measurements obtained with similar apparatus under different absorbers are reported. The АСК-1 (ASK-1) and С-2 (S-2) ionization chambers (Yu.G. Shafer, Tr. YaFAN SSSR, ser. fizich., no. 2, 1, 1958) were employed. It was found that there were considerable differences in the amplitude of the diurnal variations in Moscow and in Yakutsk. It was established that these were not due to time variations or meteorological effects and the diference was therefore ascribed to a change in the primary radiation. If it is assumed that the diurnal variations are due to some localized source, it must also be assumed that the properties of this source are very dependent

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On the coefficient of S/845/62/000/004/009/013
E032/E314

on the level of solar activity and the dependence is such that during the years of minimum solar activity the solar-diurnal variations are due to particles of lower average energy than during the years of maximum solar activity. Simple numerical calculations show that the coefficient of absorption for the radiation responsible for diurnal variations is $(0.5 \pm 0.1)\%$ cm^2/g for 1954-1955. A similar estimate for 1956-1958 yields $(0.23 \pm 0.5)\%$ cm^2/g. It follows that μ-mesons undergoing diurnal variations at minimum solar activity (1953-1955) have considerably larger absorption coefficients than during high solar activity (1956-1958). This difference in the absorption coefficients may be due to the following effects: 1) it is possible that in 1956-1958 the threshold energy for particles undergoing the diurnal variations was displaced towards higher energies so that the mean energy was appreciably increased; 2) the energy spectrum of the particles responsible for the diurnal variations in 1953-1955 was much softer than the particle spectrum responsible for the variations in 1956-1958 and 3) it is possible that both the above factors were operative at the same time. There are 1 figure and 2 tables.

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42269
S/845/62/000/004/012/013
E032/E314

3,2410 (2805)

AUTHORS: Kuz'min, A.I. and Skripin, G.V.

TITLE: Electromagnetic conditions in the neighbourhood of the Earth on May 10 - 24, 1959

SOURCE: Akademiya nauk SSSR. Yakutskiy filial. Trudy. Seriya fizicheskaya. no. 4. 1962. Variatsii intensivnosti kosmicheskikh luchey, 113 - 121

TEXT: The analysis now reported is based on experimental data obtained as a result of recording the meson component of cosmic rays with counter arrays at the Earth's surface and at 7, 20 and 60 m of water equivalent. The apparatus employed has been described by A.I. Kuz'min (Diss. NIYaF MGU, Moscow, 1960) and by the present authors (Tr. YaFAN SSSR, ser. fizich., no. 2, 195, 1958). The apparatus included a neutron monitor, ionisation chambers АСК-1 (ASK-1) and С-2 (S-2) and a vertical counter-telescope at the surface and vertical counter-telescopes at each of the above three depths. In addition, there were counter-telescopes pointing at 30° north and south of the zenith. Mean diurnal variations, corrected for barometric and temperature effects, were obtained for the cosmic-ray

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intensities and were compared with geomagnetic and ionospheric data determined at IZMIRAN (Kosmicheskiye dannyy (Cosmic-ray data),, May, 1959). Analysis of all the data showed that they were in agreement with Dorman's hypothesis (Variatsii kosmicheskikh luchey (Variation in cosmic rays), Gostekhizdat, Moscow, 1957), according to which the cosmic-ray intensity is modulated by the magnetic and electric fields associated with solar-corpuscular streams which were responsible for magnetic disturbances. The cosmic-ray data are consistent with a lateral capture of the Earth by the stream associated with the magnetic storm of May 11, 1959 (9-13 hours Yakutsk local time). Analysis of the energy spectra of the variations showed that the stream carried a frozen-in magnetic field of 10^{-5} Oe, and a radial velocity of (4-6) x 10^{8} cm/sec. It is considered that the magnetic field was not random although the stream did include appreciable irregularities. It is possible that the stream transported cosmic-ray particles which were noted as an intensity burst in the low-energy region. However, the upper limit of the transported particles must have been less than 2 BeV in view of the absence of a neutron-intensity burst at sea-level. There are 2 figures and 1 table.

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S/048/62/026/006/016/020
B125/B102

AUTHORS: Kuz'min, A. I., Krymskiy, G. F., Skripin, G. V., Chirkov, N. P., Shafer, G. V., and Shafer, Yu. G.

TITLE: Some results of investigations relating to variations of cosmic rays

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 6, 1962, 808-817

TEXT: The main results gained in the Yakutskaya laboratoriya (Yakutsk Laboratory) concerning various meteorological effects and primary variations are here reviewed, covering papers published by Kuz'min et al. in Tr. Yakutskogo filiala AN SSSR. Ser. fiz., no. 5, 1962. There are 12 figures and 1 table.

ASSOCIATION: Yakutskiy filial Sibirskogo otdeleniya Akademii nauk SSSR, Laboratoriya fizicheskikh problem (Yakutsk Branch of the Siberian Department of the Academy of Sciences USSR, Laboratory of Physical Problems)

Card 1/1

KUZ'MIN, A.I.; KRYMSKIY, G.F.; SKRIPIN, G.V.

Angular distribution of cosmic ray intensity below ground at depths equivalent to 0 to 60 meters of water. Trudy IAFAN SSSR. Ser. fiz. no.4:22-25 '62. (MIRA 15:12)
(Cosmic rays)

KUZ'MIN, A.I.

Role of the upper atmospheric layers in minor effects of the hard component of cosmic rays during chromospheric solar flares. Trudy IAFAN SSSR, Ser. fiz. no.4:61-65 '62. (MIRA 15:12)

(Cosmic rays)

KUZ'MIN, A.I.; SKRIPIN, G.V.

Variations in cosmic rays below ground during 1957-1959.
Trudy IAFAN SSSR. Ser. fiz. no.4:66-82 '62. (MIRA 15:12)
(Cosmic rays)

KUZ'MIN, A.I.; SKRIPIN, G.V.

Some principal properties of disturbed solar diurnal variations in cosmic ray intensity. Trudy IAFAN SSSR. Ser. fiz. no.4:91-102 '62. (MIRA 15:12)

(Solar radiation)
(Cosmic rays)

KUZ'MIN, A.I.; SKRIPIN, G.V.

Absorption coefficient of the intensity of cosmic rays responsible for solar diurnal variations. Trudy IAFAN SSSR. Ser. fiz. no.4:103-107 '62. (MIRA 15:12)
(Cosmic rays)
(Solar radiation)

KUZ'MIN, A.I.; SKRIPIN, G.V.

Electromagnetic conditions near the earth during the period May 10-24, 1959. Trudy IAFAN SSSR. Ser. fiz. no.4:113-121 '62. (MIRA 15:12)

(Magnetic storms)

KUZ'MIN, A.I.; KUKLIN, G.V.; SERGEYEV, A.V.; SKRIPIN, G.V.; CHIRKOV, N.P.; SHAFER, G.V.

Flare-up of cosmic ray intensity on May 4, 1960. Trudy IAFAN SSSR. Ser. fiz. no.4:132-137 '62. (MIRA 15:12)
(Cosmic rays)

KUZ'MIN, A.I.; SHAFER, G.V.; SHAFER, Yu.G.; KRASIL'NIKOV, [illegible]; KRYMSKIY, G.F.; MAMRUKOV, A.P.; SMIRNOV, N.S.; YARIN, V.I.

July 1959 according to data of comprehensive geophysical observations at Yakutsk. Trudy IAFAN SSSR. Ser. fiz. no.4:142-156 '62. (MIRA 15:12)

(Magnetic storms)
(Cosmic rays)

A. I. KUZMIN

Modulation of Cosmic Rays by Interplanetary Magnetic Field

report submitted for the th Intl. Conf. on Cosmic Rays (IUPAP), Jaipur India, 2-14 Dec 1963

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YEROFEYEV, N.M., otv. red.; MISHIN, V.M., kand.fiz.-matem. nauk, red.; POLYAKOV, V.M., kand. fiz.-matem. nauk, zam. otv. red.; KUZ'MIN, A.I., kand. fiz.-matem. nauk, red.; NIKOLAYEVA, L.K., red. izd-va; RYLINA, Yu.V., tekhn. red.

[Studies on geomagnetism and aeronomy] Issledovaniia po geomagnetizmu i aeronomii; doklady. Moskva, Izd-vo Akad. nauk SSSR, 1963. 149 p. (MIRA 16:6)

1. Sibirskoye soveshchaniye po geomagnetizmu i aeronomii. 1st, Irkutsk, 1961. 2. Chlen-korrespondetn Akademii nauk Turkmenskoy SSR (for Yerofeyev).
(Magnetism, Terrestrial) (Atmosphere, Upper)

KUZ'MIN, A.I.; SKRIPIN, G.V.; KRIVOSHAPKIN, P.A.; KRYMSKIY, G.F.

Energy spectrum of the diurnal variation of cosmic rays and the diurnal temperature fluctuations at an altitude from 20 to 40 km. Geomag. i aer. 3 no.5:830-834 S-O '63.(MIRA 16:11)

1. Yakutskiy filial Sibirskogo otdeleniya AN SSSR.

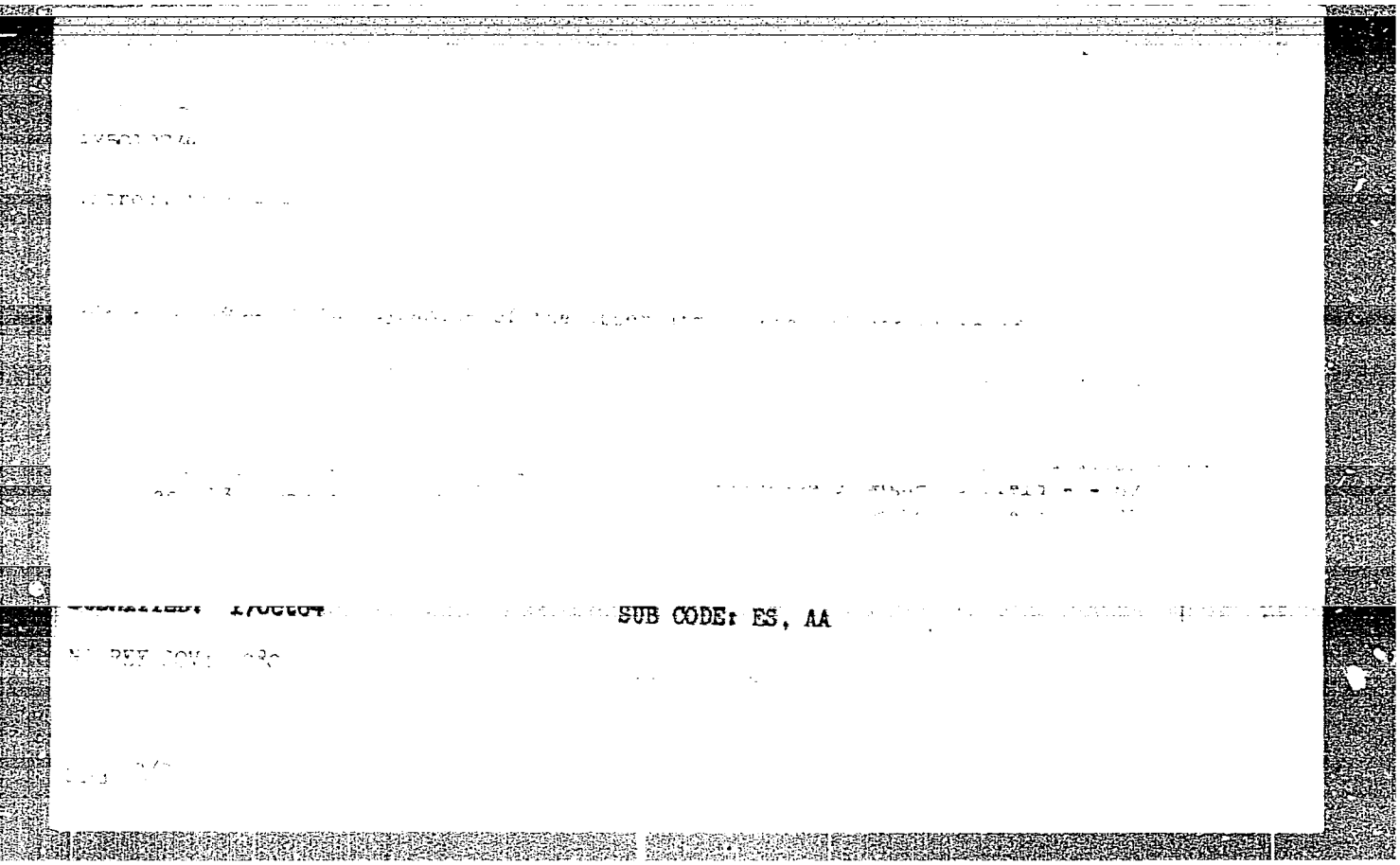
[redacted] radiation, space magnetic field

[redacted] geophysical collaboration (1958-1959) while conducting [redacted]

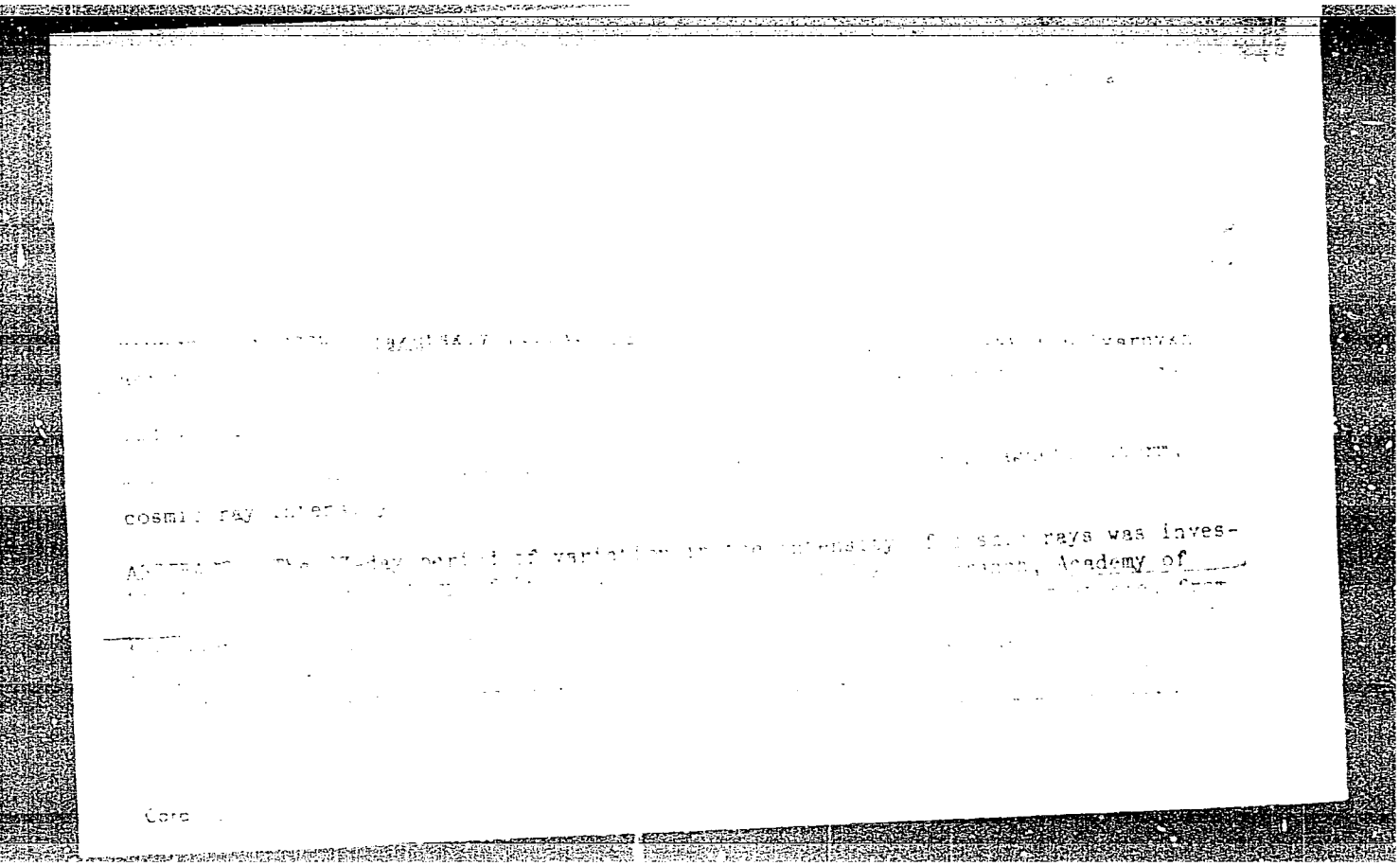
[redacted] are compared with various models depicting electromagnetic conditions in cosmic space.

TABLE OF CONTENTS (abridged):

Card 1/2



SUB CODE: ES, AA

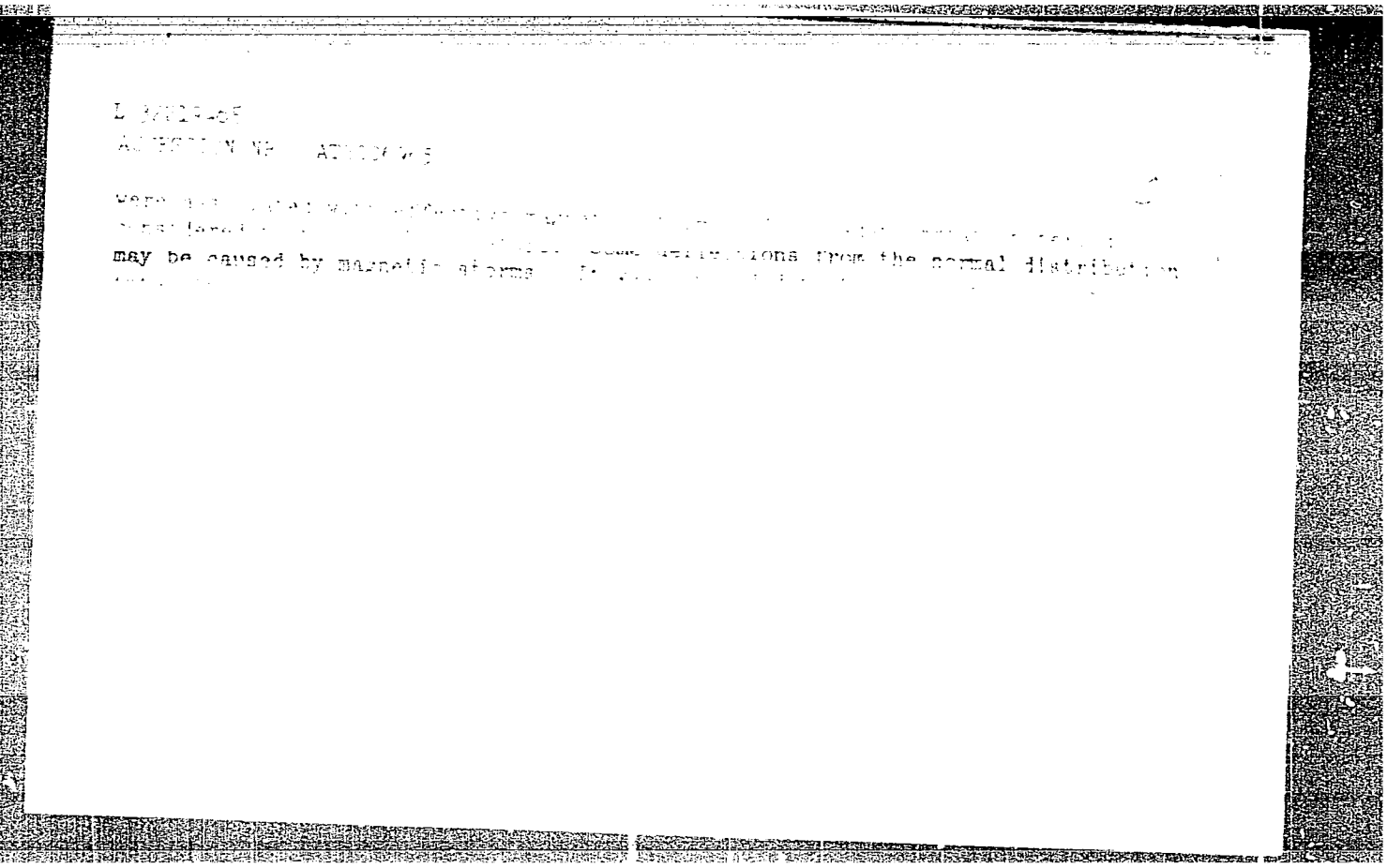


cosmic ray

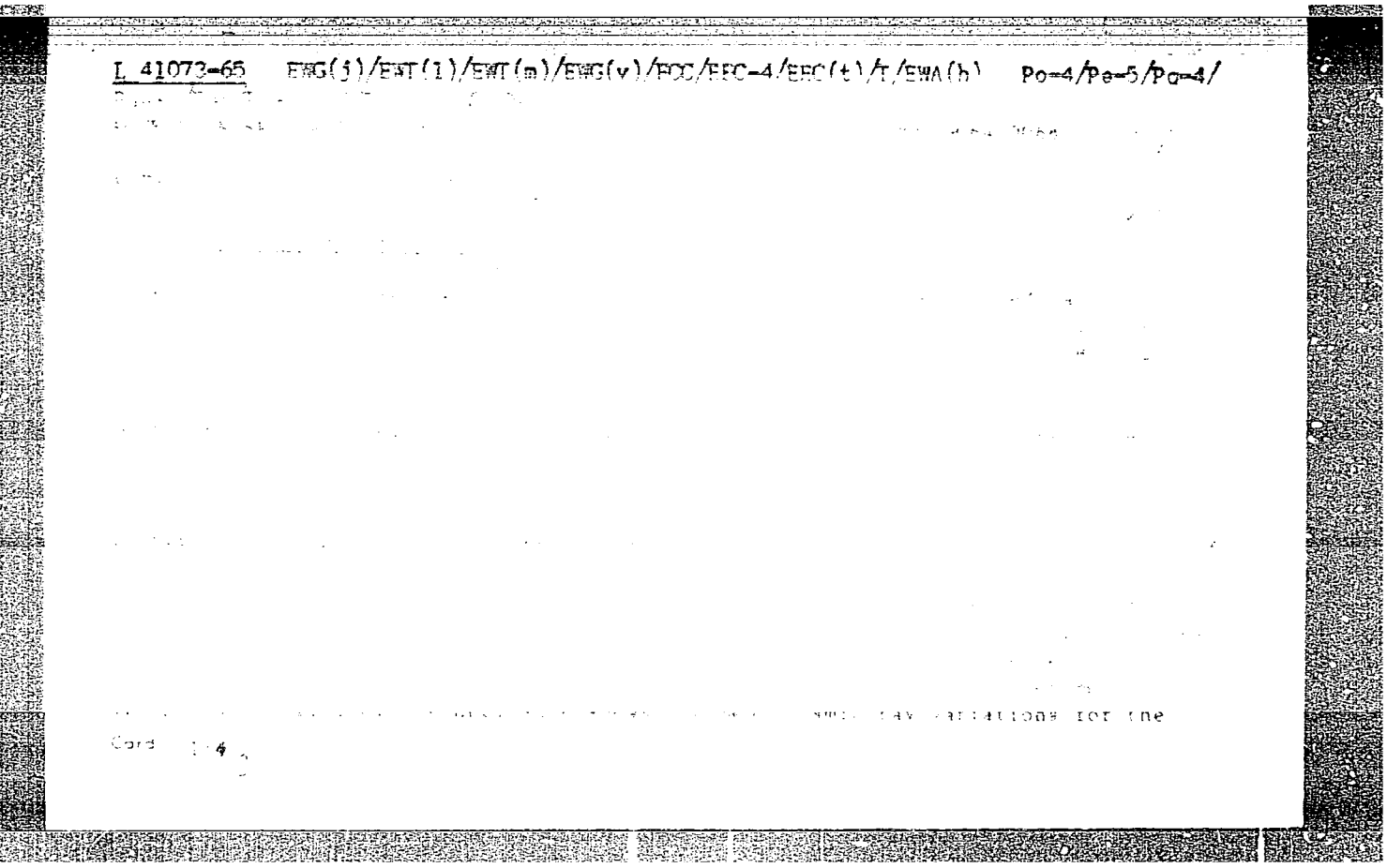
rays was inves-

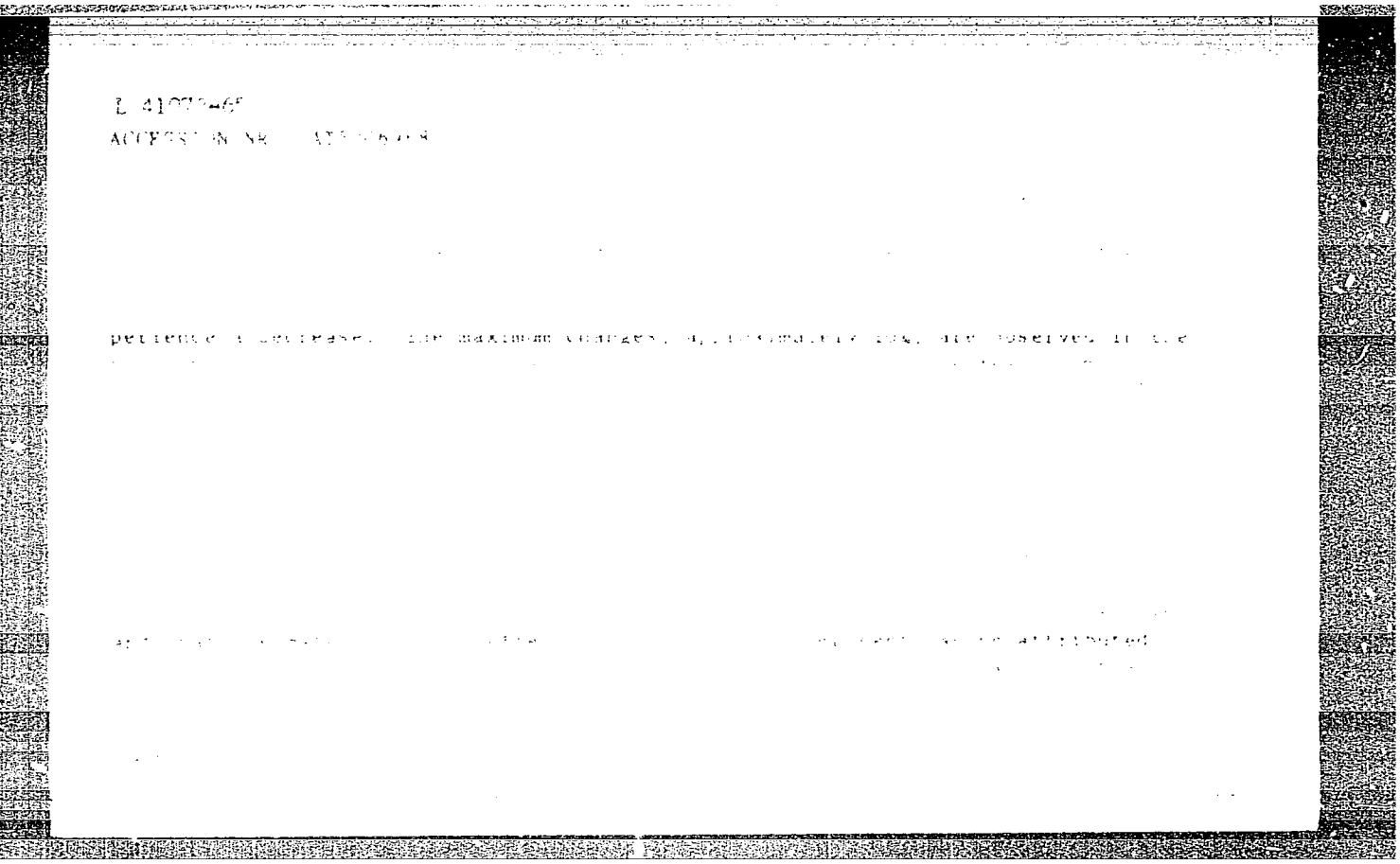
Academy of

Core



may be caused by [illegible] ions from the normal distribution





L 41073-65
ACCESSION NR: AT5006968

Card 3/4

SOURCE: AN SSSR, Izvestiya. Seriya fizicheskaya, v. 28, no. 12, [illegible], [illegible]

TOPIC TAGS: cosmic ray flux, chromospheric flare, magnetic field, [illegible] terrestrial orbit, solar particle, Forbush decrease, galactic cosmic

Card 1/3

23401-65
ACCESSION NR: AP5002101

[illegible] space, solar cosmic rays may move away from or toward the sun.

[illegible] of variation is greater in [illegible] than at middle latitudes. [illegible] as compared with the

motion of the radial interplanetary magnetic field [illegible]
galactic cosmic rays is less in the vicinity of the solar system [illegible] intensity gradient of cos-

[illegible] figure, 1 table, and 4

[illegible]: Institut kosmofizicheskikh issledovaniy i aeronomii Yakutskogo filiala Sibirskogo otdeleniya Akademii nauk SSSR

L 23401-65
ACCESSION NR: AP5002101

(Institute of Space Physics Research and Aeronomy of the Yakutsk
Branch of Siberian Division [illegible]

Card 3/3

CHIRKOV, N.P.; KUZ'MIN, A.I.; [illegible]

Asymmetry of cosmic ray variation. Izv. AN SSSR Ser. fiz. 28 no.12:2001-2004 D'64 (MIRA 18:2)

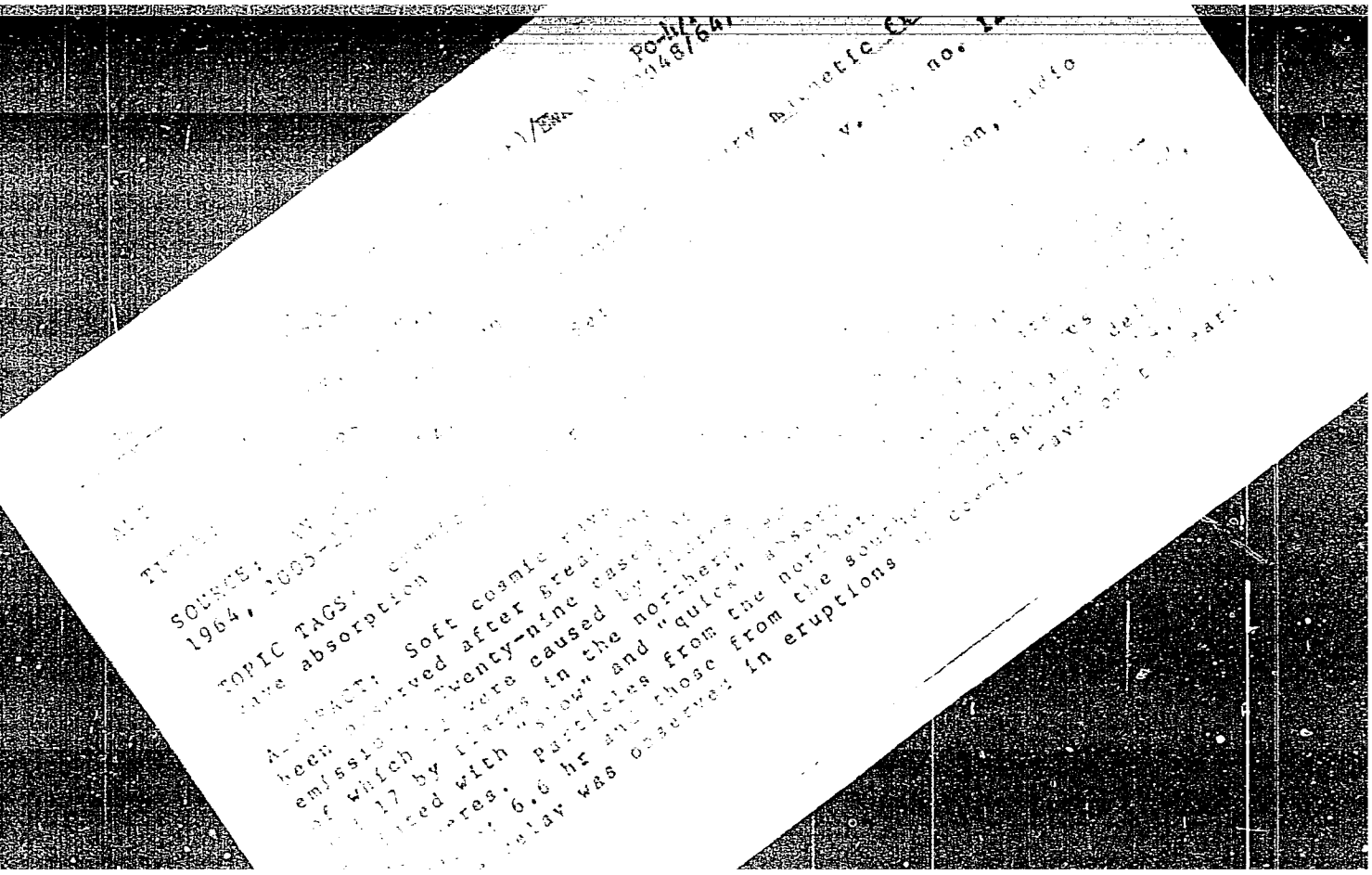
1. Institut kosmofizicheskikh issledovaniy i aeronomii Yakutskogo filiala Sibirskogo otdeleniya AN SSSR.

TITLE:

TAGS:

SUBMITTED: 00

NO REF SOV: 005



SOURCE:
1964, 1005-

TOPIC TAGS: cosmic ray
wave absorption

ABSTRACT: Soft cosmic rays
been observed after
emission
of which
17 by
ised with
res.
6.6 hr
delay was observed in eruptions

L 23399-65
ACCESSION NR: AP5002102

surface. In 14 cases the increase in cosmic rays was produced by asymmetrically distributed chromospheric flares in both solar hemispheres. Orig. art. has: 1 table and 1 formula.

ASSOCIATION: Institut kosmofizicheskikh issledovaniy i aeronomii [illegible] Akademii nauk SSSR (Institute [illegible] Siberian Branch

SUBMITTED: [illegible] ENCL: [illegible] SUB CODE: AA

NO REF SOV: 005 OTHER: 004

Card 2/2

KUZ'MIN, A.I.; KRYMSKIY, G.F.; SKRIPIN, G.V.

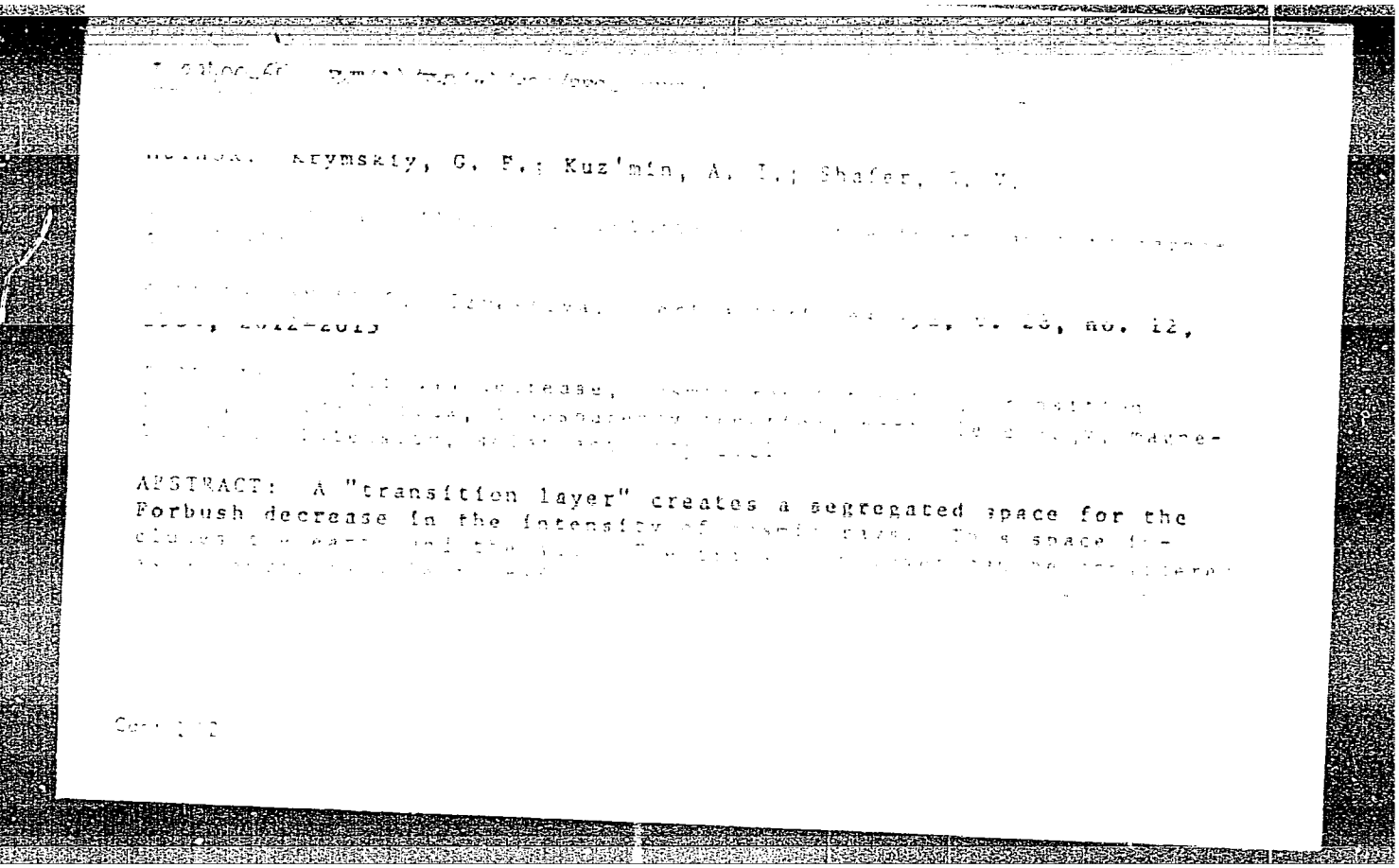
Energy and space characteristics of cosmic ray anisotropy.
Izv. AN SSSR Ser. fiz. 28 no.12:2007-2008 D '64
(MIRA 18:2)

1. Institut kosmofizicheskikh issledovaniy i aeronomii Yakutskogo filiala Sibirskogo otdeleniya AN SSSR.

ALTUKHOV, A.M.; KHZ'MIN, A.I.; KRYMSKIY, G.F.; SHUKIN, G.V.; CHIRKOV, N.P.

Relation of the anisotropy of cosmic rays. Izv. AN SSSR Ser. fiz. 28 no.12:2009-2011 D '64 (MIRA 18:2)

1. Institut kosmofizicheskikh issledovaniy i aeronomii Yakutskogo filiala Sibirskogo otdeleniya AN SSSR.



Krymskiy, G. F.; Kuz'min, A. I.; Shafer, T. V.

----, 2012-2013

----, vol. 28, no. 12,

ABSTRACT: A "transition layer" creates a segregated space for the Forbush decrease in the intensity of

L 23400-65
ACCESSION NR: AP5002103

through the envelope to the [illegible]

[illegible] Institut kosmofizicheskikh issledovaniy i aeronomii
Yakutskogo filiala Sibirskogo otdeleniya [illegible]
stitute of Space Physics [illegible]

[illegible] 00

NO REF SOV: 003

ENCL: 00

OTHER: 005

SUB CODE: AA

Card 2/2

L 1894-66 EWT(1)/FCC GS/GW

ACCESSION NR: AT5022829 UR/0000/65/000/000/0131/0136

AUTHOR: Kuz'min, A. I.; Krymskiy, G. F.

TITLE: Cosmic ray bursts

SOURCE: Vsesoyuznoye soveshchaniye po kosmofizicheskomu napravleniyu issledovaniy kosmicheskikh luchey. 1st, Yakutsk, 1962. Kosmicheskiye luchi i problemy kosmofiziki (Cosmic rays and problems in cosmophysics); trudy soveshchaniya. Novosibirsk, Redizdat Sib. otd. AN SSSR, 1965, 131-136

TOPIC TAGS: cosmic ray intensity, cosmic radiation energy, solar flare, space magnetic field

ABSTRACT: The paper gives a brief analysis of the frequency distributions and temporal and energy characteristics of cosmic ray bursts, and reports on principal results of experimental studies of bursts conducted for the purpose of determining the structure of the interplanetary magnetic field. The frequency of bursts in cosmic ray intensity declines sharply with the increase in the minimum energy of the primary particles responsible for the increase in the recorded component. Integrated spectra of the bursts versus energy and amplitude show that only a small proportion of chromospheric flares can produce an effect

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L 1894-66
ACCESSION NR: AT5022829

2

which can be recorded by earthbound cosmic ray detectors. The largest number of cosmic ray bursts are due to chromospheric flares on the western side of the solar disk. Solar corpuscular streams responsible for geomagnetic storms create the necessary conditions for cosmic ray propagation. Differences in the increase of the intensity of cosmic rays generated in chromospheric flares at different solar longitudes do not result from differences in the condition of generation, but reflect differences in the conditions of propagation of the particles coming from the eastern and western portions of the solar disk. The predominant direction of particle travel from western chromospheric flares is thought to be the direction of the lines of force of the interplanetary magnetic field in the vicinity of the earth. This direction lies in the ecliptic plane 50-60° to the west of the sun, confirming the twisted character of the interplanetary field. Orig. art. has: 4 figures and 3 formulas.

ASSOCIATION: Institut kosmofizicheskikh issledovaniy i aeronomii YaF SO AN SSSR (Institute of Cosmic Physics Research and Aeronomy, YaF SO AN SSSR)

55

SUBMITTED: 29Oct64 ENCL: 00 SUB CODE: AA

NO REF SOV: 011 OTHER: 019

Card 2/2

L 4510-66 EWT(1)/EWT(m)/FCC/T/EWA(h) IJP(c) GS/GW

ACCESSION NR: AT5022836 UR/0000/65/000/000/0239/0245 36 35 B+1

AUTHOR: Kuz'min, A. I.; Krivoshapkin, P. A.; Krymskiya, G. F.; Skripin, G. V.

TITLE: The study of upper atmosphere temperature variations from terrestrial measurements of cosmic rays

SOURCE: Vsesoyuznoye soveshchaniye po kosmofizicheskomu napravleniyu issledovaniy kosmicheskikh luchey. 1st, Yakutsk, 1962. Kosmicheskiye luchi i problemy kosmofiziki (Cosmic rays and problems in cosmophysics); trudy soveshchaniya. Novosibirsk, Redizdat Sib. otd. AN SSSR, 1965, 239-245

TOPIC TAGS: cosmic ray measurement, atmospheric temperature, cosmic ray intensity, upper atmosphere

ABSTRACT: Data concerning the dynamics of the mesosphere are necessary for the understanding of the coupling mechanism between the solar and terrestrial events and of the general circulation of the atmosphere. However, systematic data about atmospheric dynamics at altitudes between 20 and 80 km are practically nonexistent. The present article, consequently, gives results concerning the periodic temperature variations of the mesosphere asderived from the terrestrial measurements of cosmic rays at Yakutsk. The cosmic ray intensity was measured continuously over the 1959-1960 period at 30 and 60° from

Card 1/2

09010070

the zenith on the Earth's surface and underground at 20 and 60 m. w. equiv. (some data concerning daily variations are based on the 1958-1959 period). Experiments were carried out under the assumption that the variations in cosmic ray intensity at 60° and 20 (60) m. w. equiv. depths were caused by temperature variations of the atmosphere only. The analysis of data confirmed the accepted production mechanism for the hard cosmic ray component via intermediate nuclear-active mesons. Significant periodic changes in upper atmosphere temperature were found at the height of the ozone layer. These seasonal variations were between 35 and 50C, the 27-day variation amplitude was 5-10C, while daily variations were within the 3-7° limit. The yearly maximum appears in the fall, and the daily maximum during night hours. The observed temperature variations agree well with data from spectral observations of the night skies. The spectral results referring to altitudes of 80-120 km have amplitudes several times larger than the corresponding results for the 20-50 mb layer presented in this article. Orig. art. has: 2 formulas, 7 figures, and 2 tables.

ASSOCIATION: Institut kosmofizicheskikh issledovaniy i aeronomii YaF SO AN SSSR (Institute of Cosmic Physics Studies and Aeronomy, YaF SO AN SSSR)

SUBMITTED: 29Oct64 ENCL: 00 SUB CODE: ES, AA
NO REF SOV: 005 OTHER: 000

PC

L 4481-66 EWT(1)/EWT(m)/FCC/T/EWA(h) IJP(c) GW

ACC NR: AP5024635 SOURCE CODE: UR/0048/65/029/009/1690/1692

AUTHOR: Vernov, S.N.; Yegorov, T.A.; Yegimov, N.N.; Krasil'nikov, D.D.; Kuz'min, A.I.; Maksimov, S.V.; Nesterova, N.M.; Nikol'skiy, S.I.; Sleptsov, Ye. I.; Shafer, Yu. G.

ORG: none

37
03
19

TITLE: Plan for a large installation at Yakutsk for study of extensive air showers /Report, All-Union Conference on Cosmic Ray Physics held at Apatity 24-31 August 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 9, 1965, 1690-1692

TOPIC TAGS: primary cosmic ray, secondary cosmic ray, extensive air shower, spectral energy distribution, cosmic radiation composition, cosmic radiation anisotropy

ABSTRACT: After a discussion of the significance of extensive air showers for the investigation of ultrahigh energy primary cosmic rays, the authors briefly describe an installation to be completed in the next two or three years near sea level at latitude 62° N in the Yakutsk region; it is anticipated that the installation will yield information concerning the energy spectrum, composition, and anisotropy of primary cosmic rays with energies up to 10^{20} eV. The installation, intended for investigation of extensive air showers, will comprise 65 stations spread over an area of 23 km^2. Each station will be equipped with scintillation counters with a total sensitive area of 1 m^2 or 4 m^2, and at the central station - 10 m^2. The total sensitive area of scintil-

Card 1/2

07010 3

L 4481-65

ACC NR: AP5024635

lation counters in the whole installation will be 204 m^2. Each station will be equipped with photomultipliers (total cathode area 180 cm^2 at each station) for recording the Cerenkov flash accompanying a shower. In addition, there will be muon detectors with a total sensitive area of 22 m^2. Pulses will be transmitted from the more remote stations to the central laboratory by radio. It is anticipated that this installation will record 2 x 10^5 showers per year with energies exceeding 10^{15} eV and 2 showers per year with energies exceeding 10^{20} eV. Orig. art. has: 1 figure and 1 table.

SUB CODE: NP/ SUBM DATE: 00/ ORIG REF: 002/ OTH REF: 008

Card 2/2

CHERNOV, N.F.; KUZ'MIN, A.I.

Asymmetry in cosmic ray intensity variation. Izv. AN SSSR.Ser.f a. 29 no.10:1904-1906 O '65. (MIRA 18:10)

1. Institut kosmofizicheskikh issledovaniy i aeronomii Sibirskogo otdeleniya AN SSSR.

L 45143-66 EWT(1)/FCC GW

ACC NR: AR6027538 SOURCE CODE: UR/0313/66/000/005/0043/0043

AUTHOR: Kuz'min, A. I.; Krymskiy, G. F.; Krivoshapkin, P. A.; Skripin, G. V.; Chirkov, N. P.; Shafer, G. V.

52
B

TITLE: The nature of cosmic ray variations

SOURCE: Ref. zh. Issledovaniye kosmicheskogo prostranstva, Abs. 5.62.292

REF SOURCE: Sb. Issled. po geomagnetizmu i aeron. M., Nauka, 1966, 111-118

TOPIC TAGS: cosmic ray, cosmic ray variation, magnetic field, interplanetary magnetic field, magnetosphere

ABSTRACT: A review of studies is presented on cosmic ray variations caused by changes in the magnetosphere, the temperature of the upper atmosphere, modulation effects, and flare effects. The role of the interplanetary magnetic field in the generation of cosmic ray variations is emphasized and the characteristics of the field are evaluated. [Translation of abstract] [FM]

SUB CODE: 03, 04/ SUBM DATE: none/

Card 1/1

L 04886-67 EWT(1)/EWT(m)/FCC IJP(c) GD/GW

ACC NR: AT6027221 SOURCE CODE: UR/0000/66/000/000/0111/0118

AUTHOR: Kuz'min, A. I.; Krymskiy, G. F.; Krivoshapkin, P. A.; Skripin, G. V.; Chirkov, N. P.; Shafer, G. V.

S1
B+1

ORG: none

19

TITLE: The nature of cosmic ray variations

SOURCE: AN SSSR. Sibirskoye otdeleniye. Sibirskiy institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln. Issledovaniya po geomagnetizmu i aeronomii (Studies in geomagnetism and aeronomy). Moscow, Izd-vo Nauka, 1966, 111-118

TOPIC TAGS: cosmic ray intensity, solar cycle, magnetic field

ABSTRACT: A brief survey is given of available data concerning the variation of cosmic ray intensity and the effect responsible for this variation. The effects of fluctuations of the magnetosphere and temperature fluctuations in the upper atmosphere on cosmic ray variations are examined. Cosmic ray flares with energies up to 10 Bev, and their association with Forbush decreases are discussed in relation to their effect on cosmic ray variations. The 11-year variations, 27-day variations, and solar diurnal and annual variations are shown to be closely interrelated, and to have modulation of galactic cosmic rays by the radial inter-

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L 04889-67

ACC NR: AT6027221

planetary field as their common source. All existing observations on the variation of cosmic ray intensity are seen to indicate the existence of an external (with respect to the sun) radial interplanetary magnetic field and the predominant contribution of the dynamic effects of the field's disturbances to the modulation of galactic particles. An important feature of the field's configuration (deduced from observations of the variation of cosmic ray intensity, and also from other unrelated data) is its oblateness with respect to the plane of the ecliptic or the solar equatorial plane.

SUB CODE: 04/ SUBM DATE: 25Dec65/ ORIG REF: 026/ OTH REF: 009/

Card 2/2

L 04558-67 EWT(1)/FCC GD/AW

ACC NR: AT6027220 SOURCE CODE: UR/0000/66/000/000/0105/0110

AUTHOR: Krymskiy, G. F.; Almukhov, A. M.; Skripin, G. V.; Krivoshapkin, P. A.; Kuz'min, A. I.

27
B+1

ORG: none

TITLE: New method for studying the anisotropy of cosmic rays

SOURCE: AN SSSR. Sibirskoye otdeleniye. Sibirskiy institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln. Issledovaniya po geomagnetizmu i aeronomii (Studies in geomagnetism and aeronomy). Moscow, Izd-vo Nauka, 1966, 105-110

TOPIC TAGS: cosmic ray anisotropy, cosmic ray intensity, cosmic ray

ABSTRACT: A method is proposed for determining the instantaneous characteristics of the anisotropy of cosmic rays. The method will make it possible to obtain the anisotropy distribution in the meridional planes and to study the anisotropy of phenomena characterized by abrupt changes in the isotropic background (such as the Forbush decreases), all of which was not possible using the method of diurnal variations. The method proposed makes use of the fact that the world-wide network of stations established during the IGY makes it possible to determine the neutron component with an hourly statistical accuracy of 0.1% and, thereby,

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L 04888-66

ACC NR: AT6027220

to determine the anisotropy characteristics over a 2-hr observational period, provided that its amplitude exceeds the mean amplitude by a factor of more than 2. A distinctive feature of the method is the representation of the distribution of cosmic-ray intensity over the celestial sphere in the form of a series in spherical functions and the use of the first spherical harmonic of the series. The expression for the first harmonic yields the amplitude of the anisotropy vector and an expression for the intensity in an arbitrary direction at an angle to the direction of the anisotropy vector. The spherical analysis reduces to the solution of a system of linear equations with four unknowns. The solution of the system determines the isotropic portion of cosmic-ray intensity as well as three components of the anisotropy vector. The coefficients at the unknowns are calculated and tabulated for 38 stations, taking into account the effect of the geomagnetic field on the charged-particle trajectories, and also the energy spectrum of the variations. Orig. art. has: 6 formulas and 1 table.

SUB CODE: 04/ SUBM DATE: 25Dec65/ ORIG REF: 012/ OTH REF: 002

Card 2/2 eqfs

ACC NR: AR6027539 SOURCE CODE: UR/0313/66/000/005/0044/0044

AUTHOR: Krymskiy, G. F.; Altukhov, A. M.; Krivoshapkin, P. A.; Kuz'min, A. I; Skripin, G. V.

TITLE: A new method for investigating cosmic ray anisotropy

SOURCE: Ref. zh. Issledovaniye kosmicheskogo prostranstva, Abs. 5.62.298

REF SOURCE: Sb. Issled. po geomagnetizmu i aeron. M., Nauka, 1966, 105-110

TOPIC TAGS: cosmic ray anisotropy, linear equation, earth magnetic field, particle trajectory, radiation spectrum, variational problem

ABSTRACT: A method using the spherical analysis of data from a worldwide network of stations is suggested in order to obtain the instantaneous characteristics of cosmic ray anisotropy. The analysis can be reduced to solving a system of linear equations with four unknowns. The solution determines the isotropic intensity and three components of the anisotropy vector. Introduced is a calculation for the coefficients for the unknowns in the equations for each station. The effect of the earth's magnetic field on particle trajectories, as well as differences in the energy spectra for isotropic and anisotropic variations, is considered. Abstract. [Translation of abstract]

SUB CODE: 04

Card 1/1

ACC NR: AP6033494 SOURCE CODE: UR/0413/66/000/018/0116/0116

INVENTOR: Zhdanov, K. I.; Dubrovskiy, D. M.; Kazanskiy, B. P.; Kuz'min, A. I.; Kulikov, Ye. I.; Bespechnyy, S. P.; Yevlakhov, L. A.; Meshchaninov, Ye. G.

ORG: none

TITLE: Aircraft-propeller test stand. Class 42, No. 186169

SOURCE: Izobret prom obraz tov zn, no. 18, 1966, 116

TOPIC TAGS: aircraft propeller, ~~aircraft~~ propeller blade, propeller test stand, ~~aircraft maintenance~~, aircraft maintenance equipment, test stand

ABSTRACT: An Author Certificate has been issued for an aircraft-propeller test stand consisting of a pedestal and a propeller hub, equipped with dummy blade roots, and a hydraulic pump which supplies working fluid to the stand's components. To simulate propeller loading without rotation, hydraulic pistons, installed in the pedestal's cylindrical housing, operate through the dummy blade roots to simulate centrifugal force and thrust. To simulate the aerodynamic forces produced by the propeller's transverse inflow, it is equipped with movable hydraulic cylinders which consecutively bend the dummy blade roots. Working fluid is supplied to the hydraulic cylinders through a hydraulic pulser containing spring-loaded plungers; these are consecutively displaced by a cam mounted on the hydraulic pulser's shaft by the use of an eccentri-

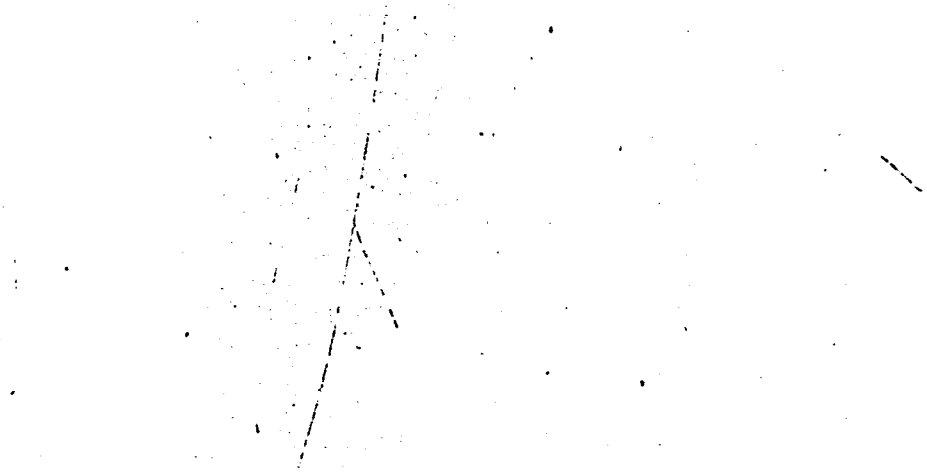
UDC: 620.178
629.13.01/06

Card 1/2

ACC NR: AP6033494

cally constructed, grooved coupling which assures the alignment of the cam for a certain travel of the spring-loaded plungers.

SUB CODE: 01/ SUBM DATE: 30Nov64/



Card . 2/2

KUZ'MIN, A.I.; NATSUK, N.S.

Practice in plotting maps of underground waters as a basis for designing wells; as exemplified by the Cherlak Agricultural Administration, Omsk Province. Izv. Omsk. otd. Geog. ob-va no.6:13-16 '64. (MIRA 18:9)

VASIL'YEVA, G.N., inzh.; ZALKIND, I.Y., inzh.; ISEROV, D.Z., inzh.; KORMER, I.M., inzh.; KUZ'MIN, A.I., inzh.; LAKHMANLOS, A.I., inzh.; SHAKHSUVAROV, K.V., inzh.

Determination of heat losses of boilers to an ambient media. Elek. sta. 36 no.2:2-6 F '65. (MIRA 18:4)

KUZ'MIN, A.M. (Novgorod)

Ways to increase the activity of students in the seventh grade geometry lessons. Mat.v shkole no.5:26-29 S-O '62. (MIRA 15:12)

(Geometry, Plane--Study and teaching)

[illegible] AP4L'55D [illegible]

[illegible] ...meiev, N. N.

TITLE: Effect of flattening [illegible] thermal and physical charac-
teristics of cylindrical fast reactors

SOURCE: Atomnaya energiya, v. 17, no. 3, 1964, 199-201

TOPIC TAGS: fast reactor, flattened core, power reactor, reactor core, breeding ratio, breeder reactor

ABSTRACT: A method for increasing the breeding ratio of high-power, [illegible] fast reactors is examined. The method consists [illegible] diameter [illegible] with-
in varying the [illegible] flattening. The
out changing the volume. This process is called flattening. The effect of flat-
flattening coefficient is expressed as [illegible] d/D. [illegible] of reactors was [illegible]
in the core. It was found that [illegible]

Card 1/3

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000928020(

L 17636-65
ACCESSION NR: AP4045332

power, core volume, and increase in temperature rise of the coolant, the volumetric portions of the fuel and fuel cladding material increase, while that of the coolant decreases. As [illegible] decreases from [illegible] to [illegible], the total breeding ratio increases, an increase in flattening and fuel element

Orig. art. has: 3 figures.

ASSOCIATION: none

Card 2/3

L 17636-65
ACCESSION NR: AP4045332

SUBMITTED: 04Nov63 ENCL: 00 SUB CODE: NP

NO REF SOV: 003 OTHER: 001

Card 3/3

KUZ'MIN, A. M.

"Acad. Vladimir Afanas'yevich Obruchev" (On his 90th Birthday) General Geology, Personalia, Izv. Tomskogo Politekhn, in-ta, 74, No 1, 1953, pp 3-12

Abs

W-31146, 1 Feb 55

KUZ'MIN, A. M.

"Microcline" (Mineralogy, Silicates) Izv. Tomskogo politekhn. in-ta, 74, No 1, 1953, pp 47-107

Abs

W-31146, L Feb. 55

KUZ'MIN, A.N.

The phenomenon of concentration streams observable during crystallization. Izv. Sib. otd. AN SSSR no.6:10-25 '58.

(MIRA 11:9)

1.Tomskiy politekhnicheskiy institut.
(Crystallization)

KUZ'MIN, A.M.

Mass crystallization. Part 1: Crystallization from supersaturated solutions on several levels with rapid cooling. Izv. TPI 95: 378-383 '58. (MIRA 14:9)
(Crystallization) (Solutions, Supersaturated)

KUZ'MIN, A.M.

Mass crystallization. Part 2: Crystallization on several levels with continuous feeding. Izv. TPI 95:384-392 '58. (MIRA 14:9)
(Crystallization) (Solutions, Supersaturated)

KUZ'MIN, A.M.

Hoegbomite from Gornaya Shoriya. Geol. i geofiz. no.4:63-75 '60. (MIRA 13:9)

1. Tomskiy politekhnicheskiy institut.
(Gornaya Shoriya--Hoegbomite)

KUZ'MIN, A.M.

Cleavage and slip planes in rock salt. Geol. i geofiz. no.6:60-74 '60. (MIRA 13:9)

1. Tomskiy politekhnicheskiy institut.
(Dislocation in crystals) (Salt)

KUZ'MIN, A.M.

Upper Paleozoic gold formation in the vicinity of Tomsk. Geol. rud. mestorozh. no.2:130-131 Mr-Ap '61. (MIRA 14:5)

1. Tomskiy politekhnicheskiy institut.
(Tomsk region--Gold ores)

KUZ'MIN, A.M.

Argon retention in mircoline. Geokhimiia no.5:456-458 '61.
(MIRA 14:5)

1. Politekhnicheskiy institut imeni S. M. Kirova, Tomsk.
(Argon) (Microcline)

YERMOLAYEV, V.A.; KUZ'MIN, A.M.

Microhardness of natural zirconium ($ZrSiO_4$) crystals. Izv. vys. ucheb. zav.; fiz. no.1:63-68 '64. (MIRA 17:3)

1. Tomskiy politekhnicheskiy institut imeni Kirova.

KULONOV, V.V.; LIKHOV, B.B.; [illegible]

Effect of flattening on certain [illegible] characteristics of a cylindrical fast reactor. [illegible] energ. 17 no.3:199-201 S '64.

KHALFIN, L.O., prof., otv. red.; IVANIYA, V.A., dots., kand. geol.-miner. nauk, red. toma; BAZHENOV, I.K., prof., red.; BULYNNIKOV, A.Ya., prof., red.; GORBUNOV, M.G., dots., kand. geol.-miner. nauk, red.; KUZ'MIN, A.M., prof., red.; MIKOV, D.S., prof., red.; ROGOV, G.M., dots., kand. geol.-miner. nauk, red.; SULAKSHIN, S.S., dots., kand. tekhn. nauk, red.; KHAKHLOV, V.A., prof., red.

[Materials on the geology and minerals of Western Siberia; reports] Materialy po geologii i poleznym iskopaemym Zapadnoi Sibiri; doklady. Tomsk, Izd-vo Tomskogo univ., 1964. 424 p. (MIRA 18:3)

1. Konferentsiya, posvyashchennaya 100-letiyu so dnya rozhdeniya akademika M.A.Usova, Tomsk, 1963.

L 25438-66 EPF(n)-2/EWT(m)/ETC(f)/EWG(m) WW/GS
ACC NR: AT6005814 SOURCE CODE: UR/0000/65/000/000/0051/0069

AUTHORS: Khromov, V. V.; Slesarev, I. S.; Shmelev, A. N.; Kuz'min, A. M. 59 57 B+1

ORG:

TITLE: Effective method of calculating two dimensional and three dimensional reactors 14

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Nekotoryye voprosy fiziki i tekhniki yadernykh reaktorov (Some problems in the physics and engineering of nuclear reactors). Moscow, Atomizdat, 1965, 51-69

TOPIC TAGS: nuclear reactor characteristic, computer application, algorithm, neutron flux, gas kinetic equation, iteration, neutron distribution, nuclear reactor technology

ABSTRACT: The authors present a possible simplified method, with a much smaller amount of the computation, for designing two dimensional and three dimensional nuclear reactors. The algorithm for the calculation of the neutron fields is constructed and the assumption that 2

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the spatial components of the neutron field can be separated in each zone. The purpose of the investigation was to develop a simple and reliable algorithm, which would make possible to perform with sufficient accuracy a whole series of different variants of calculations without requiring an excessive volume of computer memory. The formalism of separating the variables is used not for a detailed description of the neutron field in different parts of the reactor, but to obtain integral characteristics of the field along selected layers of the system. This simplifies the equations, yet makes it possible to carry out detailed calculations of the neutron distribution along any line which is parallel to a coordinate axis. The computation scheme includes an iteration procedure for successively calculating the one dimensional systems which correspond to different layers of the reactor. The section headings are: I. Derivation of the equation of the effective method. II. Scheme of calculation of the neutron field in problems of external sources. III. Calculation of a neutral field in a nuclear reactor. IV. Concerning the formalism of the method. V. Generalization of the method for the case of the gas kinetic equation. VI. Verification of the method. The method was checked

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with several reactor variants and provided good accuracy within 10 -- 20 iterations, using 15 to 20 minutes of the M-20 computer time. The authors thank S. B. Shikhov and L. N. Yurova for useful discussions during the development of the method. Orig. art. has: 4 figures, 39 formulas, and 6 tables.

SUB CODE:18,09/ SUBM DATE: 05Jun65/ ORIG REF: 002/ OTH REF: 003

L 25430-66 EPF(n)-2/EWT(m)/ETC(f)/EWG(m) WW/GS

ACC NR: AT6005815 SOURCE CODE: UR/0000/65/000/000/0070/0077

AUTHORS: Slesarev, I. S.; Shikhov, S. B.; Khromov, V. V.; Shmelev, A. N.; Kuz'min, A. M.; Shishkov, L. K.

ORG: none

TITLE: Design of fast reactor using electronic computers

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Nekotoryye voprosy fiziki i tekhniki yadernykh reaktorov (Some problems in the physics and engineering of nuclear reactors). Moscow, Atomizdat, 1965, 70-77

TOPIC TAGS: nuclear reactor technology, nuclear reactor operation, nuclear reactor characteristics, fast reactor, computer application, algorithm, electronic computer/ M-20 electronic computer

ABSTRACT: The purpose of the paper was to develop a computer algorithm which, on the one hand, is sufficiently simple and requires few operations, and on the other hand displays the quantitative and qualitative characteristics of different reactor variants, so as to permit the best design choice. A comprehensive computation program

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ACC NR: AT6005815

intended for the M-20 computer is described. This program, which is based on a single-group method proposed by one of the authors. (Shikhov, with A. I. Novozhilor, Atomnaya energiya v. 8, 209, 1960) in conjunction with the method of conditional separation of variables, makes it possible to determine the critical load for established dimensions of the reactor, to determine the reflector saving, and to evaluate the integral of many-group fluxes and the neutron importance in all the zones of the reactor. The program also includes thermal calculations which yield the diameter of the fuel elements, the heat flux to the surface, and the main heat exchange parameters and the ratio of the volumes of the components of the active zone to the total volume. In addition to this program, there has been developed at the Moscow Engineering Physics Institute a program, based on a diffusion-transport approximation, for calculating the critical parameters of a cylindrical reactor by the method of conditional separation of variables. This calculation is carried out by a multigroup method with an electronic computer, and makes it possible to calculate the critical parameters of a many-zone reactor. It is used essentially to calculate the finally chosen optimal variants of the reactors, since it requires more computer time than the foregoing comprehensive

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L 25430-66
ACC NR: AT6005815

program. Mention is also made of a program developed under the leadership of G. I. Marchuk to solve the cylindrical problem by conditional separation of variables with a single reflector saving for all groups. This should lead to a more accurate allowance for the edge effects in the lower part of the neutron spectrum. Orig. art. has: 7 formulas and 1 table.

SUB CODE: 18,09/ SUBM DATE: 05Jun65/ ORIG REF: 001/ OTH REF: 001

Card 3/3 cc

ACC NR: AT7005803 (A,N) SOURCE CODE: UR/0000/66/000/000/0033/0052

AUTHORS: Kuz'min, A. M.; Khromov, V. V.

ORG: none

TITLE: A few-group method of designing multi-region reactors

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Inzhenerno-fizicheskiye voprosy yadernykh reaktorov (Problems of nuclear reactor engineering and physics); sbornik statey. Moscow, Atomizdat, 1966, 33-52

TOPIC TAGS: NUCLEAR REACTOR DESIGN, nuclear reactor, approximation method, boundary value problem, differential equation, neutron diffusion, mathematic matrix, gas kinetics, neutron distribution

ABSTRACT: A method is proposed for designing multi-region reactors in a diffusion approximation based on reducing a large number of neutron energy groups to small groups, without taking into account the importance of the neutrons. The initial system of multi-group equations is:

$$-\hat{D}\Delta\Phi(r)+\hat{P}\Phi(r)=\frac{1}{K_i}\chi(\nu\Sigma_f,\ \Phi(r))$$

under the boundary conditions

$$\Phi(r)|_{r=R}=0\ .$$

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This system is reduced to the following system of differential equations for $f_\alpha(r)$:

$$-\langle D_\alpha\rangle \Delta f_\alpha(r) + \langle \Sigma_\alpha\rangle f_\alpha(r) - \sum_{l=1}^{\alpha-1} \langle \Sigma_{l\alpha}\rangle f_l(r) =$$

$$= \frac{1}{K}\langle \chi_\alpha\rangle \cdot \sum_{j=1}^{m} \langle \nu\Sigma_j'\rangle f_j(r).$$

Equations for integral fluxes are derived. Analysis of the obtained equations shows that they form a closed homogeneous system of equations for a few-group method of designing a multi-region reactor. The method is extended to the case of the multi-group kinetic equation of neutron transport. A check of the method in calculating the critical parameters of one- and two-meter cylindrical reactors showed good results. An 18-group system of constants was used, and the maximum number of small groups was 4. The authors thank A. N. Shmelev and I. S. Slesarev for discussion, and V. Apse and L. M. Tochenyy for aid in the calculations. Orig. art. has: 4 tables, 48 formulas, 3 graphs, and 2 diagrams.

SUB CODE: 18/ SUBM DATE: none/ ORIG REF: 004/ OTH REF: 001

ACC NR: AP7000802 (A,N) SOURCE CODE: UR/0089/66/021/005/0406/0408

AUTHOR: Khromov, V. V.; Kuz'min, A. M.

ORG: none

TITLE: Effective method of multigroup reactor design

SOURCE: Atomnaya energiya, v. 21, no. 5, 1966, 406-408

TOPIC TAGS: nuclear reactor characteristic, neutron diffusion, fast neutron, fast reactor, approximate solution, iteration, computer calculation, nuclear reactor design

ABSTRACT: With an aim at simplifying the calculations for reactor design, the authors consider in the diffusion approximation a one-dimensional multizone quasicritical cylindrical reactor with axial symmetry, writing the multigroup equations in vector-matrix form. The energy interval is broken up into m bands, each of which includes a number of major groups. A closed system of reactor equations is obtained, which is solved by the method of iterating the source. The approximate results obtained are compared with a computer solution for a fast-neutron reactor with an annular active zone. The approximate solution is shown to converge to the exact solution when the number of energy sub-bands is larger than four. A saving of 3 - 5 times of computer time is estimated. Orig. art. has: 2 figures, 9 formulas, and 1 table.

SUB CODE: 18,20/ SUBM DATE: 09Jun66/ ORIG REF: 001/ OTH REF: 002

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UDC: 621.039.51.13

Kuzmin, A. N.

USSR/Biology - Zoology

Card 1/1 Pub. 22 - 41/45

Authors : Kuz'min, A. N.

Title : Structure and growth changes in spermiducts and ovaries of young sturgeon (Acipenser Güldenstadtii Br.)

Periodical : Dok. AN SSSR 99/4, 645-647, Dec 1, 1954

Abstract : Biological data on the structure and growth changes in spermiducts and ovaries of young sturgeon, are presented. Seven USSR references (1947-1951). Illustrations.

Institution : The A. A. Zhdanov State University, Leningrad

Presented by: Academician E. N. Pavlovskiy, September 13, 1954

KUZ'MIN, A. N., Cand Bio Sci -- (diss) "Development of the reproductive system of carp living in different latitudes (in relation to age and growth)." Leningrad, 1957, 20 pp (All Union Scientific Research Institute of the lake and river fish economy), 100 copies (KL, 36-57, 104)